



Environmental Impact Analysis Process

**Environmental Assessment for
Irrigation System for the Golf Course**

**United States Air Force
Air Education and Training Command
Columbus Air Force Base, Mississippi**

January 2007

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JAN 2007		2. REPORT TYPE		3. DATES COVERED 00-00-2007 to 00-00-2007	
4. TITLE AND SUBTITLE Environmental Assessment for Irrigation System for the Golf Course			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) 14th Flying Training Wing, 555 Simler Blvd Ste 102, Columbus AFB, MS, 39701			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT The purpose of the proposed action is to install an irrigation system to improve the quality of the grass and the playability of the golf course. This environmental assessment (EA) evaluates the proposed action, the no action alternative, and the cumulative impacts. No alternative locations were identified for this project. Under the no action alternative, the golf course irrigation system would not be installed. Resources considered in the impact analysis were air quality, land use, groundwater, water supply, wastewater treatment wetlands/floodplains, noise, prehistoric and cultural resources, soils, surface water, military mission, hazardous materials and wastes, vegetation and wildlife including threatened and endangered species, and environmental justice. No significant impacts would result from the proposed action, or no action alternative, nor would any cumulative impacts result from other construction actions at Columbus AFB or the surrounding area.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 47	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

COLUMBUS AIR FORCE BASE (AFB), MISSISSIPPI

An Environmental Assessment (EA) was prepared for a project at Columbus AFB. Columbus AFB is approximately ten miles northwest of the city of Columbus in Lowndes County, Mississippi.

The proposed action is to install an irrigation system for Whispering Pines golf course. No alternative locations were identified for the irrigation system. The no action alternative of continuing to not irrigate the golf course would result in no impacts to the environment, but dismissed since it would not provide the water needed to improve the quality of the grass and the playability of the golf course.

All construction activity is anticipated to occur for less than two months in any specific area. No measurable impact on floodplain, flood flows, or drainage patterns will result from the proposed action.

There are no threatened or endangered species on base, and impacts to vegetation would be insignificant. There would be no impact to wildlife. No generation or disposal of hazardous wastes would occur within the wetlands or the flood plain zone. Air quality and noise impacts would only occur during construction and are considered to be insignificant. Columbus AFB is in an air quality attainment area; therefore, a conformity determination pursuant to the Clean Air Act is not required.

Finding of No Significant Impact: Based on my review of the facts and analysis contained in the environmental assessment, which is incorporated herein, I conclude the proposed action will not have a significant impact either by itself or considering cumulative impacts. Accordingly, the requirements of the National Environmental Policy Act, regulations promulgated by the President's Council on Environmental Quality, and 32 Code of Federal Regulations 989, *Environmental Impact Analysis Process* have been fulfilled, and an Environmental Impact Statement is not required and will not be prepared.



DAVID K. GERBER, Colonel, USAF
Commander, 14th Flying Training Wing

Date 18 Jan 07

Cover Sheet

ENVIRONMENTAL ASSESSMENT Whispering Pines Golf Course Irrigation System

- Responsible Agency: Department of the Air Force, Air Education and Training Command, 14th Flying Training Wing, Columbus Air Force Base (AFB), Lowndes County, Mississippi.
- Proposed action: To install an irrigation system for the Whispering Pines golf course at Columbus AFB.
- Written comments and inquiries regarding this document should be directed to: 14 FTW/PA, 555 Seventh Street, Columbus AFB, Mississippi 39710, (662) 434-7068.
- Abstract: The purpose of the proposed action is to install an irrigation system to improve the quality of the grass and the playability of the golf course. This environmental assessment (EA) evaluates the proposed action, the no action alternative, and the cumulative impacts. No alternative locations were identified for this project. Under the no action alternative, the golf course irrigation system would not be installed. Resources considered in the impact analysis were air quality, land use, groundwater, water supply, wastewater treatment, wetlands/floodplains, noise, prehistoric and cultural resources, soils, surface water, military mission, hazardous materials and wastes, vegetation and wildlife including threatened and endangered species, and environmental justice. No significant impacts would result from the proposed action, or no action alternative, nor would any cumulative impacts result from other construction actions at Columbus AFB or the surrounding area.

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GOLF COURSE IRRIGATION PROJECT COLUMBUS AIR FORCE BASE

Chapter 1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 History of Columbus AFB

Installation construction began in September 1941 and the first flight training began with 25 cadets who had already completed most of their training at Barksdale Field, Louisiana. In April 1942 the installation was named Columbus Army Flying School. During World War II over 7,400 men graduated and received their wings and commission from Columbus. After the end of the war, training activities slowed significantly and in 1946 the field was deactivated. In March 1950, the Air Force field reopened as a contract flying school and re-designated Columbus Air Force Base. Under the supervision of Air Training Command (ATC), the base provided both basic and primary flight training for pilots during the Korean conflict. The Air Training Command relinquished command to the Strategic Air Command (SAC) in 1955 and, for the next 14 years, Columbus AFB was the home for B-52s and KC-135s. In 1969, SAC transferred Columbus AFB to the Air Education and Training Command (AETC), returning it to its original mission of training pilots. Since that time, the base has trained pilots in the T-37 and T-38 jet trainers. In 1996, the base added the T-1 aircraft to the T-37s and T-38s in the Specialized Undergraduate Pilot Training (SUPT) program. The T-6 Texan will replace the T-37 from 2006 through 2010.

The Air Force must maintain the highest level of quality education and training for its personnel. AETC is the Air Force's major command responsible for training and educating its personnel. Columbus AFB, located in Mississippi, is under command and control of AETC and is unique in that it is one of only three bases in the Air Force that trains student pilots in the SUPT program. Upon completion, most SUPT graduates are assigned to other bases for flying assignments in other aircraft. Some graduates remain at Columbus AFB for duty as SUPT instructors.

1.2 Purpose of and Need for the Proposed Action

1.2.1 Background

IAW Air Force Instruction (AFI) 34-116 *Air Force Golf Program* and the United States Golf Association, a survey of the Whispering Pines Golf Course was conducted between 24-27 July 2006. The report, located at <http://www.afsv.af.mil/Golf/MaintenanceDocs/Columbusreportforwebpage.doc>, recommends an irrigation system for the course, to include all greens and fairways which are not currently irrigated.

The director of golf submitted annual funding requests for NAF funding for an irrigation system since 2000. Requests have been denied due to high annual rainfall in the Columbus, MS area. Although average annual rainfall for the area is 56 inches, it is distributed unevenly through the year with June, July, and August receiving the least amount of rainfall. Dry conditions in summer counteract improvements made to the course during wetter months.

The irrigation system would prevent damage to root systems and promote healthier grass and a more playable, desirable course.

1.2.2 Golf Course Irrigation System

Under the proposed action, an irrigation system would be installed on holes one, two, three, four, five, six, and eight. Holes seven and nine are already equipped with sprinklers.

1.3 Location of the Proposed Action

Columbus AFB, the home of the AETC 14th Flying Training Wing (14 FTW), is located in Lowndes County, approximately ten miles northwest of the city of Columbus, Mississippi (Figure 1.3.1). The installation is approximately 4,903 acres. The Tombigbee River is located one mile northwest and the Buttahatchee River is approximately 1,000 feet north. Single-family homes and mobile trailer communities are immediately east of the base, U.S. Highway 45 is to the east and southeast, with Oakdale Park Subdivision and mobile home parks to the south. The affected environment includes Columbus AFB and the surrounding properties described above.

Under the proposed action, the golf course irrigation system would be located on the golf course, bordered by C Street, Independence Drive, F Street, and Seventh Street. The specific proposed locations of pipes and sprinkler heads are illustrated on site maps in Appendix E.

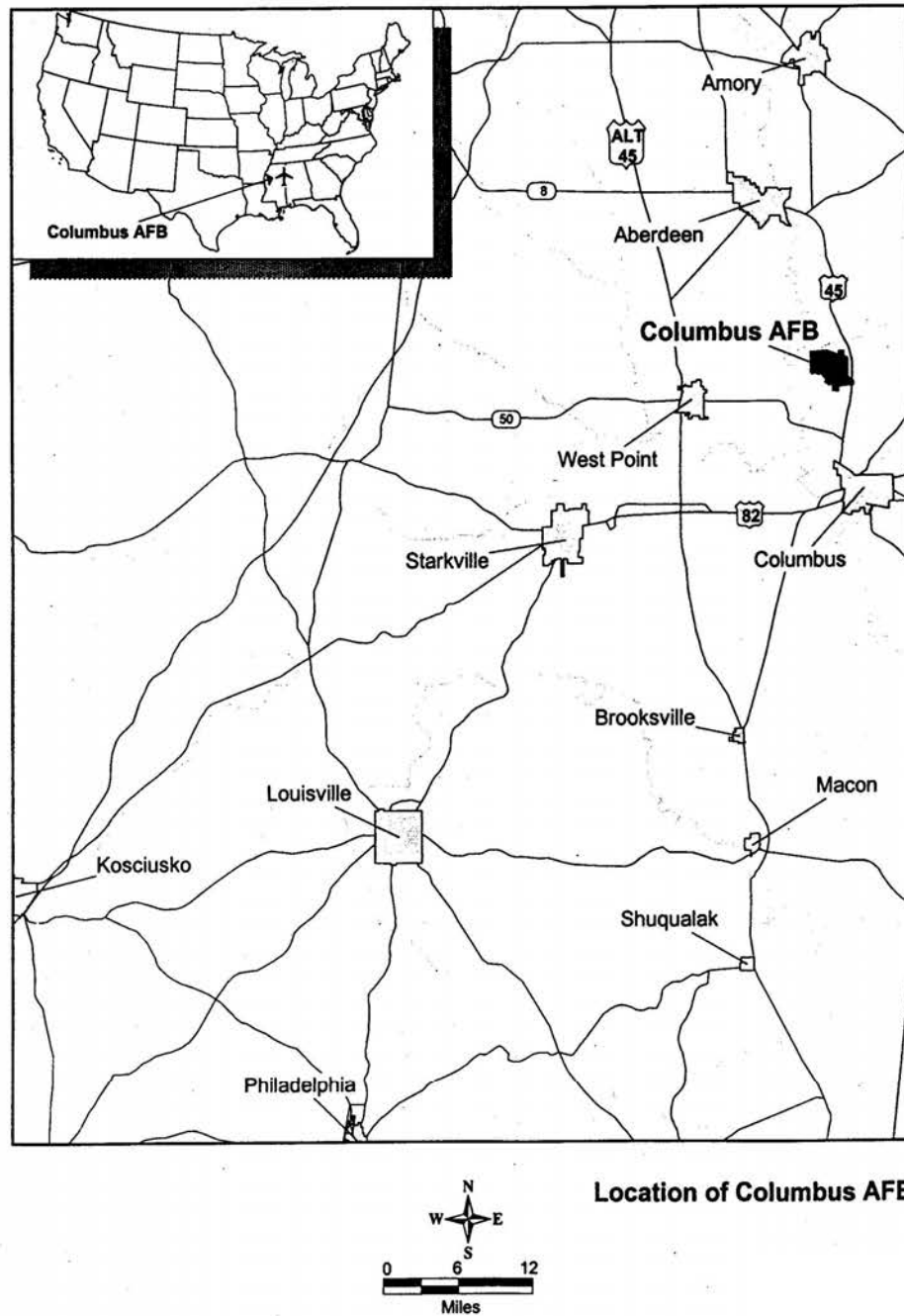


Figure 1.3.1 Site Location Map

1.4 Decision to be Made and the Decision Maker

The decision to be made by the Air Force is whether to:

- Install the golf course irrigation system, or
- Not accomplish the installation of the golf course irrigation system (no action alternative).

1.5 Scope of the Environmental Review

This EA identifies, describes and evaluates potential environmental impacts which may result from implementing the proposal and potential cumulative impacts from other projects planned for the base. It also identifies relevant environmental permits. As appropriate, the affected environment and environmental consequences of the proposal and alternative action may be described in terms of site-specific descriptions or regional overview.

The preparers considered the full spectrum of resource categories for this EA. However, some topics were evaluated in more detail than others. A preliminary analysis determined the following issues would not impact, or be impacted by, the proposed action or the no action alternative, and eliminates these topics from further discussion.

Land Use: The land in the proposed site was previously disturbed during development of the original golf course. Installation of an irrigation system would not alter the land use for the property. No long-term land use impacts are expected. Therefore, land use is not evaluated further in this EA.

Wetlands/Floodplains: The US Department of Agriculture, Natural Resources Conservation Service conducted wetlands delineation for the entire base. The US Army Corps of Engineers, Mobile District, certified the delineation on 31 May 2002. The proposed site is not located within a delineated wetland area or in the 100-year floodplain. No impacts are anticipated; therefore wetlands and floodplains, which are typically assessed under biological resources, are not evaluated in this EA.

Noise: The primary noise source at Columbus AFB is from aircraft operations. Aircraft activities include specialized undergraduate pilot training, aircraft maintenance and transient military aircraft operations. During periods of no flying activity, noise results primarily from aircraft maintenance, shop operations, ground traffic movement, occasional construction and similar sources. This noise is almost entirely restricted to the base proper and is comparable to sounds that occur in typical communities. Baseline noise conditions from aircraft operations at Columbus AFB are defined using the Air Force developed NOISEMAP (Version 6.5) modeling program. Any increase in noise levels during the construction would be of limited duration and would not change the current noise maps. Therefore, noise is not evaluated further in this EA.

Prehistoric and Cultural resources: Columbus AFB personnel and contractors are required to manage prehistoric and cultural resources in accordance with all federal, state, and local requirements and with the Integrated Cultural Resource Management Plan. No archaeological

or historic resource impacts are anticipated. Therefore, archaeological and historic resources are not evaluated further in this EA.

Soils: Columbus AFB soils are moderately well to poorly drained silt and clay loams of the Prentiss Rosella Steens and Cahaba Prentiss Guyton associations. These soils are characteristic of river terrace and floodplain deposits. These soil associations cover approximately equal areas at Columbus AFB, with the upper terrace soils in the southeastern half of the base and the lower flood plain soils in the northwestern portion. These soils overlie gravel and sand deposits, which in turn overlie clay and sandy clay deposits. Soil pH generally ranges between 4.5 and 6.5 and soil bearing capacity is approximately 2000 pounds per square foot. Columbus AFB personnel and contractors are required to manage soil in accordance with all federal, state, and local requirements and with the Integrated Natural Resource Management Plan. The construction sites would occur in areas previously significantly modified by construction of the existing course, and would have no impact on native soils. Therefore, soils are not evaluated further in this EA.

Threatened and Endangered Species: A United States Department of Agriculture study completed in July 2005 found no endangered, threatened, or special status species on Columbus AFB. Therefore, threatened and endangered species are not evaluated further in this EA.

Wildlife: Woodland and grassland vegetative communities support habitat for a variety of wildlife species on Columbus AFB. Confirmed mammal species observed on the base include gray squirrel, southern flying squirrel, swamp rabbit, white tailed deer, bats and rodents. Bird species common to lowland areas include the pine warbler, the cardinal, the summer tanager, Carolina wren, ruby throated hummingbird, blue jay and tufted titmouse. The majority of this wildlife is found in the undeveloped base area. Columbus AFB personnel and contractors are required to manage wildlife in accordance with all federal, state, and local requirements and with the Integrated Natural Resource Management Plan. The golf course is located in a previously developed area of the base. No impacts to wildlife are anticipated. Therefore, wildlife is not evaluated further in this EA.

Hazardous Waste: Columbus AFB personnel and contractors are required to manage hazardous waste in accordance with all applicable federal, state and local regulations and with the Hazardous Waste Management Plan. The golf course has never generated any hazardous waste. No impacts to hazardous waste are anticipated. Therefore, hazardous waste is not evaluated further in this EA.

Wastewater Treatment: Columbus AFB personnel are required to manage wastewater in accordance with all applicable federal, state and local regulations and with Air Force Instruction (AFI) 32-7041 *Water Quality Compliance*. The golf course would not generate additional wastewater as a result of implementing the proposed action. No impacts to wastewater are anticipated. Therefore, wastewater is not evaluated further in this EA.

The following resource categories are evaluated in detail in this EA: aesthetic quality, hazardous materials, water supply, surface water and stormwater, vegetation, and environmental justice.

1.6 Applicable Regulatory Requirements

The director of golf, 14 MSG/SVRG, shall submit a stormwater pollution prevention plan to the Water Quality Manager for review. The stormwater pollution prevention plan shall contain site-specific best management practices for preventing pollution due to erosion and/or sedimentation.

1.7 Introduction to the Organization of the Document

This EA is organized into four chapters. Chapter 1 contains a statement of the purpose and need for the action, the location of the proposed action, the scope of the environmental review, applicable regulatory requirements and a description of the EA's organization. Chapter 2 provides a history of the formulation of alternatives, briefly describes the alternatives eliminated from further consideration, describes the proposed action and no action alternative, lists other actions anticipated at Columbus AFB and summarizes any environmental impacts. Chapter 3 contains a general description of the biophysical resources and baseline conditions that could potentially impact or be impacted by the proposed action or no action alternative. Chapter 4 analyzes the environmental consequences. Appendix A lists document preparers. Appendix B lists persons and agencies consulted while preparing this EA. Appendix C contains Interagency and Intergovernmental Coordination for Environmental Planning correspondence. Appendix D contains the Air Force Form 813, Request for Environmental Impact. Appendix E contains site location maps for the proposed action. Appendix F lists source documents referenced in this EA.

Chapter 2.0 DESCRIPTION OF THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

2.1 Introduction

This chapter has seven sections: Introduction, history of the formulation of alternatives, detailed description of the proposed action, description of the no action alternative, identification of other actions announced for the base and comparison of the environmental impacts of the proposed action and no action alternative.

2.2 History of the Formulation of Alternatives

Columbus AFB must ensure it has the facilities and infrastructure to support its flying mission. Therefore, installation personnel manage an ongoing planning process to evaluate how well existing facilities and infrastructure meet mission requirements. Once a need is identified, the base planning process determines how best to meet the requirements. This process includes developing alternatives that consider issues such as the need for the project, locating the project to best accomplish the mission, and completing these tasks in the most cost-effective and efficient manner within a sufficient timeframe to ensure no degradation to the mission.

2.3 Detailed Description of the Proposed Action

The proposed action is to install an irrigation system on holes one, two, three, four, five, six, and eight. Holes seven and nine are already equipped with sprinklers. The irrigation system would be located on the Columbus AFB golf course, bordered by C Street, Independence Drive, F Street, and Seventh Street. The specific proposed locations of pipes and sprinkler heads are illustrated on site maps in Appendix E. Specifications for pipe fittings, sprinkler heads, and controls are located in the Air Force Form 813, in Appendix D. Backflow preventers would be installed at each tap from which water would be drawn, and are illustrated as rectangles on site maps in Appendix E. An additional 1,050,000 gallons of water per year would be applied to the golf course, and an additional five gallons per year of MSMA (Monosodium Acid Methanearsonate) would be applied in June for summer weed control.

2.4 Description of the No Action Alternative

The no action alternative is to not accomplish the installation of an irrigation system on the golf course.

2.5 Other Actions Announced for Columbus AFB

BRAC actions require the relocation of additional personnel and aircraft to Columbus AFB, necessitating additional construction between now and 2008. These actions include constructing a new IFF Squadron Operations Facility and an Unaccompanied Officers Quarters (UOQ) dormitory. Additional BRAC actions include expansion of the SUPT building, Flight Simulator building, Egress Shop and the Consolidated Aircraft Support System. An environmental assessment for these actions is currently being prepared as part of the General Plan-based Environmental Impact Analysis Process.

Temporary trailers will be placed northeast of Building 216 and adjacent to the parking apron and will house the IFF mission until the IFF Squadron Operations Facility is completed. An environmental assessment for the placement of the trailers and the installation of a sporting equipment storage building at the youth ball fields near Building 9123 has been prepared and is in review.

A Fire/Rescue Station is currently under construction and is scheduled for completion in 2007. A Mission Support Group Complex will be under construction beginning in late 2006 and continuing through 2007. A Military Family Housing Privatization initiative project could begin during 2008 with construction continuing through 2012. A portion of an electrical transmission line will be constructed on the southwestern corner of the base during late 2006 continuing into 2007.

There are also numerous actions planned for the surrounding area. Construction of three buildings for a steel production facility in the Lowndes County Industrial Park is underway and scheduled to continue through 2006. These facilities are anticipated to bring jobs to the community, and are not expected to impact Columbus AFB. An electrical transmission line will be constructed from West Point to the Lowndes County Industrial Park with construction beginning in 2006. This would supply power to the steel production facility. Another transmission line will be constructed from the main Tennessee Valley Authority line west of the installation along the southern property line in the former Regency site. This line will increase power reliability for Columbus AFB.

2.6 Identification of the Preferred Alternative

The preferred alternative is to implement the proposed action as described in Section 2.3.

2.7 Comparison of Environmental Effects of All Alternatives

Implementing the proposed action would have a long-term, positive impact on aesthetic quality of the installation. Healthier and greener turf would develop in the highly visible areas of "C" Street, Independence Avenue, and Harpe Boulevard as a direct result of the installation of the irrigation system.

No significant impacts to hazardous materials management are anticipated. Additional hazardous materials would be used in accordance with all applicable local, state, and federal regulations and with AFI 32-7086 *Hazardous Materials Management*.

No significant impacts to water supply are anticipated. Water supply far exceeds projected demand. No significant impacts to surface water are anticipated. The only source of surface water is SAC Lake, which is located in an area remote from the golf course. No significant impact to stormwater is anticipated. Stormwater runoff is only expected to increase slightly and drainage patterns for the base would not be impacted.

Implementing the proposed action would have a long-term, positive impact on the vegetation at the golf course due to the increased water for the grass.

Activities associated with the proposed action and no action alternative would not impose adverse impacts on adjacent populations. Therefore, no disproportionately high and adverse effects would occur to minority and low-income populations.

There are no environmental impacts anticipated from implementing the no action alternative.

Chapter 3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter describes the baseline conditions on the installation. Within this context, only specific components relevant to potential impacts are described in detail.

3.2 Description of the Affected Environment

A description of the proposed location for the golf course irrigation system is found in section 2.3. Site maps are located in Appendix E.

3.2.1 Aesthetic Quality

Columbus AFB must meet or exceed the provisions of the HQ AETC/CE Service Contract Interim Command Standards for grounds maintenance. Though the golf course typically exceeds these requirements, the fairways historically turn brown during the hottest and driest summer months. Since the golf course is in a highly visible area of the base, it would be desirable to improve the quality of the grass in this area.

3.2.2 Hazardous Materials

Columbus AFB personnel and contractors are required to manage hazardous materials in accordance with AFI 32-7086, *Hazardous Materials Management*, and all applicable federal, state, and local regulations. The director of golf must provide material safety data sheet submittals and periodic usage reports to the hazardous materials manager.

The golf course is authorized to apply numerous pesticides, herbicides, fungicides, and fertilizers. Of these, five are applied at regular intervals. Trimec herbicide is applied for winter weed control at the rate of 20 pounds per month in February and March. MSMA is applied for summer weed control at the rate of 5 gallons in May. Also in May, 13-13-13 International Fertilizer is applied at the rate of 2500 pounds. Amdro is applied for fire ant control at the rate of one pound per month during June, July, and August. Princep Caliber 90 is applied for winter weed control at the rate of 5 gallons in October. Other chemicals are applied as they are required based on varying conditions in the landscape.

3.2.3 Water supply

Columbus Light and Water can supply Columbus AFB with a maximum of 14 million gallons per day (mgd) of drinking water. The current average water demand is 6.5 - 7 mgd.

3.2.4 Surface Water and Stormwater

The installation has four stormwater outfalls that flow to the Buttahatchee River, Tennessee-Tombigbee Waterway and Stinson Creek. Installation bioenvironmental personnel sample the stormwater outfalls annually. Columbus AFB manages stormwater discharges in accordance with the Mississippi Department of Environmental Quality National Pollutant Discharge Elimination System (NPDES) Permit #MSR001351.

The Tombigbee River is located one mile northwest and the Buttahatchee River is approximately 1,000 feet north of Columbus AFB. The Buttahatchee River flows west along the northern boundary of the base before entering the Tombigbee River, which flows in a southerly direction along the installation's west boundary. SAC Lake is the only large body of water on the base, and is located on the opposite end of the base from the proposed project area. An unnamed tributary of Stinson Creek flows west and south through the golf course, entering a Stinson Creek stormwater outfall on the southwest boundary of the installation.

3.2.5 Vegetation

Grass species located along roadways, runways and cleared areas include plumbgrass, switchgrass, beggartick and tickclover (USAF, 1998). Columbus AFB also contains the woodland species oak, maple, willow, bald cypress, sweet gum and loblolly pine.

Vegetation located in the project area is Bermuda grass.

3.2.6 Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued on February 11, 1994. The EO instructed each federal agency to make "achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

The minority population in the census tracts comprising the project area (Census Tracts 1 and 2) is proportionately lower (24.9 and 26.7 %, respectively, 2000 Census Data) than both Lowndes County (44.0 %) and the state (39.3 %). The poverty rate for the project area census tracts is similarly considerably lower than the county and state.

3.2.7 Cumulative Impacts

Cumulative impacts result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes other actions. Foreseeable projects are described in section 2.5 of this document.

Chapter 4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter provides the scientific and analytic basis for comparing the environmental consequences of implementing the proposed action and the no action alternative. The potential effects on environmental resources from implementing each alternative are described. This chapter only discusses resources that have any potential for impacts. Resources that would not be impacted are discussed in greater detail in chapter 1.

4.2 Description of the Effects of Both Alternatives on the Affected Environment

4.2.1 Aesthetic Quality

Methodology: An impact to aesthetic quality is considered significant if a proposed action placed buildings which were not in accordance with the base architectural theme, or if it caused deterioration of the landscape sufficient to place Columbus AFB in noncompliance with the HQ AETC/CE Service Contract Interim Command Standards for grounds maintenance.

Proposed action:

Implementing the proposed action would improve the aesthetic quality of the grounds by establishing greener and healthier grass in a highly visible area of the installation. Therefore, the proposed action would result in a long-term, positive impact on the aesthetic quality of the grounds.

No action alternative:

Implementing the no action alternative would result in no impact on the aesthetic quality of the grounds.

4.2.2 Hazardous Materials

Methodology: An impact from hazardous materials is considered significant if improper storage or handling of hazardous materials resulted in harm to human health or the environment.

Proposed action:

The proposed action would result in the application of an additional five gallons of MSMA to the golf course each June. This additional hazardous material would be used in accordance with all applicable local, state, and federal regulations and with AFI 32-7086 *Hazardous Materials Management*. Therefore, implementing the proposed action would result in no hazardous materials related impacts to human health or the environment.

No action alternative:

No additional hazardous materials usage is associated with continuing not to irrigate the golf course. Therefore, implementing the no action alternative would result in no hazardous materials related impacts to human health or the environment.

4.2.3 Water Supply

Methodology: An impact to water supply would be considered significant if it interfered with provision of water for the installation, or if it required new water infrastructure to be installed.

Proposed action:

The design and operational planning for the irrigation system would be coordinated with Darryl Petters, the licensed water operator for the base. Backflow preventers would be installed at each tap to prevent contamination to the potable water supply. In addition, all watering would take place at night. This practice would eliminate irrigation during the peak demand periods. It would also eliminate irrigation during the hottest hours of the day, minimizing water lost to evaporation. Costs for the additional water would be absorbed by the golf course.

The additional 1,050,000 gallons required per year would not impact the water supply for the installation since the current average water availability exceeds average water demand by 7 million gallons per day. No impacts to firefighting capability are anticipated for this reason.

Personnel and contractors are required to manage water supply on Columbus AFB in accordance with AFI 32-1061 *Providing Utilities to US Air Force Installations*, and with all applicable local, state, and federal regulations. The irrigation system would not interfere with installation water supply and no additional infrastructure would be necessary to support the additional water requirements for the irrigation system. Therefore, implementing the proposed action would result in no impacts to the installation water supply.

No action alternative:

No additional water usage is associated with continuing not to irrigate the golf course. Therefore, implementing the no action alternative would result in no impacts to the installation water supply.

4.2.4 Surface Water and Stormwater

Methodology: An impact to surface water or stormwater would be considered significant if it resulted in pollution to surface water or stormwater, or if it adversely affected Columbus AFB drainage.

Proposed action:

The only significant body of surface water on Columbus AFB is SAC Lake, which is located in an area remote from the golf course.

Stormwater drainage from the golf course flows west and south through the course to an unnamed tributary of Stinson Creek, entering a Stinson Creek stormwater outfall on the southwest boundary of the installation. Estimated average stormwater runoff would increase by approximately ½ inch for the month of September as a result of implementing the proposed action. However, this would not alter drainage patterns for the installation.

The director of golf would be required to submit a site-specific Stormwater Pollution Prevention Plan to 14 CES/CEV prior to installing the irrigation system. The plan would include best management practices to prevent pollution from reaching the stormwater system.

Columbus AFB personnel and contractors are required to manage water supply on Columbus AFB in accordance with Air Force Instruction (AFI) 32-7041 *Water Quality Compliance*, and with all applicable local, state, and federal regulations. There is no surface water in the vicinity of the proposed site and best management practices implemented during installation of the irrigation system would prevent impacts to stormwater. No impacts to drainage are anticipated. Therefore, implementing the proposed action would result in no adverse impact to surface water or stormwater.

No action alternative:

Implementing the no action alternative would result in no impact to surface water or stormwater.

4.2.5 Vegetation

Methodology: Impacts to vegetation would be considered significant if they resulted in the taking of an endangered species.

Proposed action:

The proposed golf course irrigation system would be located in a highly landscaped and improved area, where there is no native vegetation. A 2005 USDA field survey found no endangered, threatened or special status species on Columbus AFB.

The proposed irrigation system would be located on the golf course in an area of improved grounds. A sod cutter would be used to remove existing Bermuda grass on the course for placement of pipes and sprinklers. The same Bermuda grass would be replaced over the pipes when installation is complete. The grass would then be watered during the hottest summer months, and in other dry periods.

Implementing the proposed action would result in a long-term, positive impact to the existing vegetation, resulting in healthier, greener grass and a more playable golf course.

No action alternative:

Implementing the no action alternative would result in no impacts to vegetation.

4.2.6 Environmental Justice

Methodology: An impact to environmental justice would be considered significant if the proposed action would create adverse human health or environmental effects which would disproportionately affect minority populations and/or low-income populations.

Proposed action:

Installation of the golf course irrigation system would occur within the confines of the installation, and would not be visible from outside Columbus AFB. No hazardous materials or wastes would be disposed within the community. Installation of the golf course irrigation system would result in no impact to human health or the environment, no impact to minority or low-income populations, and thus no impact to environmental justice.

No action alternative:

Implementing the no action alternative would result in no impact to human health or the environment and no adverse impact to minority or low-income populations, and thus no impact to environmental justice.

4.2.7 Cumulative Impacts

Methodology: A cumulative impact would be considered significant if the proposed action in combination with foreseeable actions created a significant impact to human health or the environment as defined for each resource previously described in this document.

Proposed action:

Implementing the proposed action would result in no significant impacts to human health or the environment. Therefore, there is no potential for cumulative impacts either at the site or in the surrounding area.

No action alternative:

Implementing the no action alternative would result in no significant impacts to human health or the environment. Therefore, there is no potential for cumulative impacts either at the site or in the surrounding area.

4.3 Summary of Impacts

Table 4.3.1 Summary of Impacts

Table 4.3.1		
Resource (Applicable Section)	Proposed Action	No action Alternative
Aesthetic Quality 4.2.1	Long-term, positive impact on aesthetic quality by creating healthier and greener turf in high visibility areas of the installation.	No impact
Hazardous Materials 4.2.2	No hazardous material related impacts to the environment are anticipated because the additional chemicals to be applied to the golf course would be managed in accordance with all applicable local, state, and federal regulations and with AFI 32-7086 <i>Hazardous Materials Management</i> .	No impact
Water Supply 4.2.3	Water usage of 1,050,000 million gallons per year. This would not result in any impact to water supply because Columbus Light and water can supply up to 14 million gallons per day, and the average water demand is 6.5 – 7 million gallons per day.	No impact
Surface Water and Stormwater 4.2.4	Installing the golf course irrigation system would not impact surface water as there is no surface water in the project area. Estimated average stormwater runoff would increase by ½ inch for the month of September as a result of implementing the proposed action. However, stormwater would not be adversely impacted because it would not alter drainage patterns for the installation.	No impact

Table 4.3.1		
Resource (Applicable Section)	Proposed Action	No action Alternative
Vegetation 4.2.5	Installing the golf course irrigation system would have a long-term, positive impact on the vegetation at the golf course because it would improve the health of grass.	No impact
Environmental Justice 4.2.6	Implementing the proposed action would not impose adverse impacts on adjacent populations; therefore, no disproportionately high and adverse effects would occur to minority and low income populations.	No impact
Cumulative Impacts 4.2.7	Installing the golf course irrigation system would result in no significant impacts to human health or the environment. Therefore, there is no potential for cumulative impacts either at the site or in the surrounding area.	Continuing to not irrigate the golf course would result in no impacts to human health or the environment. Therefore, there is no potential for cumulative impacts either at the site or in the surrounding area.

4.4 Conclusion

Implementing the proposed action would have a long-term, positive impact on the aesthetic quality of the installation and on the vegetation at the golf course.

Based on the findings of this environmental assessment, no significant impact on human health or the natural environment would be anticipated as a result of installing a golf course irrigation system, and the proposed action is selected as the preferred alternative.

Appendix A LIST OF PREPARERS

Name	Degree	Professional Discipline	Years of Experience
Kathy Edwards	B.A., Environmental Science	Environmental Compliance Specialist	9

Appendix B LIST OF PERSONS AND AGENCIES CONSULTED

Kathy Lunceford, Vicksburg Ecological Service
US Fish and Wildlife Service
6578 Dogwood View Parkway Suite A
Jackson, MS 39213

Ms. Mildred Tharpe
State Clearinghouse for Federal Programs
1301 Woolfolk Building, Suite E
501 North West St.
Jackson, MS 39213

**Appendix C INTERAGENCY AND INTERGOVERNMENTAL COORDINATION
FOR ENVIRONMENTAL PLANNING**



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 14TH FLYING TRAINING WING
COLUMBUS AIR FORCE BASE MISSISSIPPI

28 November 2006

Mr. Michael F. Smith
Chief, Environmental Flight
555 Simler Boulevard, Suite 114
Columbus AFB MS 39710-6010

Ms. Mildred Tharpe
State Clearinghouse for Federal Programs
1301 Woolfolk Bldg, Suite E
501 North West St.
Jackson MS 39213

Dear Ms. Tharpe

The U.S. Air Force has prepared the attached draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) to assess the potential environmental impacts of installing an irrigation system for the Whispering Pines Golf Course at Columbus Air Force Base (AFB), Mississippi, and to document the decision that there would be no environmental impacts associated with the project. The purpose of the proposed action is to promote healthier grass and a more playable, desirable golf course.

The Air Force is requesting input from federal, state, and local agencies on the draft EA and draft Finding of No Significant Impact in accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*. Please identify any resources or projects within your agency's purview that may be potentially impacted or could add to the cumulative impact analysis. Please provide detailed information for any resources or projects that would occur during the same period as the Air Force's proposal. Please provide any comments or information by 1 January 2007 directly to Ms. Kathy Edwards, 14 CES/CEV, 555 Simler Blvd., Ste. 114, Columbus AFB MS 39710.

Your assistance in providing information is greatly appreciated. Ms. Edwards can be reached at (662) 434-7144.

Sincerely

A handwritten signature in black ink, appearing to read "Michael F. Smith", is positioned below the word "Sincerely".

MICHAEL F. SMITH, REM

Attachments:

1. Draft Environmental Assessment
2. Draft Finding of No Significant Impact

EO 12372
WEEKLY LOG
PGM=N150

STATE OF MISSISSIPPI
STATE CLEARINGHOUSE FOR FEDERAL PROGRAMS

DATE 12/14/06
12/20/06

MS APPLICANT NO.: MS061215-003R
IMPACT AREA(S): LOWNDES

CONTACT: KATHY EDWARDS
PHONE: (662) 434-7144

APPLICANT:
DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 14TH FLY TRAIN WING
555 SIMLER BLVD., SUITE 114
COLUMBUS AFB MS 39710

FEDERAL AGENCY: US AIR FORCE

FUNDING: FEDERAL
LOCAL
TOTAL

APPLICANT
OTHER

STATE
PROGRAM

DESCRIPTION: DRAFT ENVIRONMENTAL ASSESSMENT AND DRAFT FINDING OF NO
SIGNIFICANT IMPACT TO ASSESS THE POTENTIAL ENVIRONMENTAL
IMPACTS OF INSTALLING AN IRRIGATION SYSTEM FOR THE WHISPER-
ING PINES GOLF COURSE AT COLUMBUS AIR FORCE BASE, MS.

CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER

1301 WOOLFOLK BLDG., SUITE E - JACKSON, MS 39201 (601) 359-6762

- THIS IS AN ACKNOWLEDGEMENT ONLY -

STATE AGENCIES MUST REVIEW CERTAIN PROPOSALS PRIOR TO RECEIVING MISSISSIPPI INTERGOVERNMENTAL REVIEW PROCESS CLEARANCE. THE MISSISSIPPI DEPARTMENT OF ARCHIVES AND HISTORY REVIEWS ANY PROPOSALS INVOLVING CONSTRUCTION, SUCH AS A HIGHWAY OR AN APARTMENT COMPLEX FOR COMPLIANCE WITH CULTURAL RESOURCES AND HISTORIC PRESERVATION. MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, REVIEWS APPLICATIONS IN ACCORDANCE WITH THE FEDERAL WATER POLLUTION CONTROL ACT. THE MISSISSIPPI DEPARTMENT OF MARINE RESOURCES REVIEWS APPLICATIONS FOR CONSISTENCY WITH THE COASTAL PROGRAM.

IF APPLICATIONS ARE FOR PROJECTS OF LOCAL IMPACT, THEY SHOULD BE SENT TO THE APPROPRIATE PLANNING AND DEVELOPMENT DISTRICT AT THE SAME TIME. PLEASE NOTE THAT ONE OF OUR REQUIREMENTS IS THE USE OF STANDARD FORM 424. THE DEPARTMENT OF FINANCE AND ADMINISTRATION PREPARES AND DISTRIBUTES A WEEKLY LOG LISTING PERTINENT INFORMATION CONTAINED ON THIS FORM. OUR ADDRESS IS 1301 WOOLFOLK BLDG., SUITE E - JACKSON, MS 39201 AND OUR PHONE NUMBER IS (601)359-6762.



STATE OF MISSISSIPPI
DEPARTMENT OF FINANCE AND ADMINISTRATION

MEMORANDUM

TO: DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 14TH FLY TRAIN WING
555 SIMLER BLVD., SUITE 114
COLUMBUS AFB MS 39710

DATE: JAN 03 2007

FROM: STATE CLEARINGHOUSE FOR FEDERAL PROGRAMS

SUBJECT: REVIEW COMMENTS - Activity:
DRAFT ENVIRONMENTAL ASSESSMENT AND DRAFT FINDING OF NO
SIGNIFICANT IMPACT TO ASSESS THE POTENTIAL ENVIRONMENTAL
IMPACTS OF INSTALLING AN IRRIGATION SYSTEM FOR THE WHISPER-
ING PINES GOLF COURSE AT COLUMBUS AIR FORCE BASE, MS.

State Application Identifier Number MS061215-003R

Location: LOWNDES

Contact: KATHY EDWARDS

The State Clearinghouse, in cooperation with state agencies interested or possibly affected, has completed the review process for the activity described above.

INTERGOVERNMENTAL REVIEW PROCESS COMPLIANCE:

- (✓) We are enclosing the comments received from the state agencies for your consideration and appropriate actions. The remaining agencies involved in the review did not have comments or recommendations to offer at this time. A copy of this letter is to be attached to the application as evidence of compliance with Executive Order 12372 review requirements.
- () Conditional clearance pending Archives and History's approval.
- () None of the state agencies involved in the review had comments or recommendations to offer at this time. This concludes the State Clearinghouse review, and we encourage appropriate action as soon as possible. A copy of this letter is to be attached to the application as evidence of compliance with Executive Order 12372 review requirements.
- () The review of this activity is being extended for a period not to exceed 60 days from the receipt of notification to allow adequate time for review.

COASTAL PROGRAM COMPLIANCE (Coastal area activities only):

- () The activity has been reviewed and complies with the Mississippi Coastal Program. A consistency certification is to be issued by the Mississippi Department of Marine Resources in accordance with the Coastal Zone Management Act.
- () The activity has been reviewed and does not comply with the Mississippi Coastal Program.

Cecil Hamilton
President

David Winfield
Vice President

Larry Crowley
Secretary / Treasurer

Rupert L. "Rudy" Jr.
Executive Director

TO: Department of the Air Force
HQ 14th Fly Train Wing
555 Simler Blvd.
Columbus AFB, MS 39710

DATE: December 27, 2006
CLEARINGHOUSE NUMBER: MS061215-003R

The Golden Triangle Planning & Development District, as Regional Clearinghouse for Federal Programs, has been notified of the intent to apply for Federal assistance as described below:

Draft Environmental Assessment and Draft Finding of No Significant Impact to Assess the Potential Environmental Impacts of Installing an Irrigation System for the Whispering Pines Golf Course at the Columbus Air Force Base, Mississippi.

Total Project Cost:

Federal Agency/Funds:

- ☐ The Regional Clearinghouse has received and reviewed the application for Federal assistance as described above.
- ☐ The Regional Clearinghouse has notified appropriate local and regional agencies of this proposed project, and
 - ☐ Interest has been expressed in conferring with the applicant(s).
 - ☐ The attached comments were submitted and are to become a part of this Review.
 - ☐ No response was received from these agencies.
- ☒ The proposed project appears to be consistent with the following plan(s) for economic/community development in the District
 - ☒ GTPDD DISTRICT DEVELOPMENT PROGRAM
 - ☐ Comprehensive Economic Development Strategy
- ☐ The proposed project is not consistent with applicable economic/community development plan(s) for this District.
- ☒ This notice constitutes final Regional Clearinghouse Review and Comment on the proposed project, and requirements of E.O. 12372 have been met at the Regional level.

Comments:

c: State Clearinghouse


Rupert L. "Rudy" Johnson
Executive Director



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 14TH FLYING TRAINING WING
COLUMBUS AIR FORCE BASE MISSISSIPPI

28 November 2006

Mr. Michael F. Smith
Chief, Environmental Flight
555 Simler Boulevard, Suite 114
Columbus AFB MS 39710-6010

Ms. Kathy Lunceford
Vicksburg Ecological Service
United States Fish and Wildlife Service
6578 Dogwood View Parkway, Suite A
Jackson, MS 39213

Dear Ms. Lunceford

The U.S. Air Force has prepared the attached draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) to assess the potential environmental impacts of installing an irrigation system for the Whispering Pines Golf Course at Columbus Air Force Base (AFB), Mississippi, and to document the decision that there would be no environmental impacts associated with the project. The purpose of the proposed action is to promote healthier grass and a more playable, desirable golf course.

No threatened or endangered species are known to exist anywhere on Columbus AFB according to the *Endangered and Threatened Species Survey of Columbus AFB, July 2005*. Please provide any additional comments or information by 1 January 2007, directly to Ms. Kathy Edwards, 14 CES/CEV, 555 Simler Blvd., Ste 114, Columbus AFB MS 39710.

Your assistance in providing information is greatly appreciated. Ms. Edwards can be reached at (662) 434-7144.

Sincerely

A handwritten signature in black ink, reading "Michael F. Smith", is positioned above the typed name.

MICHAEL F. SMITH, REM

Attachments:

1. Draft Environmental Assessment
2. Draft Finding of No Significant Impact

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Mildred Thorpe
State Clearinghouse
1301 Woolfolk Bldg. Suite E
501 North West St.
Jackson MS, 39213

2. Article Number

(Transfer from service label)

7004 1350 0004 0410 3882

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

Deborah Morgan

☒ Agent☐ Addressee

B. Received by (Printed Name)

Deborah Morgan

C. Date of Delivery

D. Is delivery address different from item 1? ☐ YesIf YES, enter delivery address below: ☒ No

3. Service Type

☒ Certified Mail☐ Express Mail☐ Registered☐ Return Receipt for Merchandise☐ Insured Mail☐ C.O.D.

4. Restricted Delivery? (Extra Fee)

☐ Yes**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Kathy Lunceford
Vicksburg Ecological Service
United States Fish and Wildlife Service
6578 Dogwood View Parkway, Suite A
Jackson, MS 39213

2. Article Number

(Transfer from service label)

7004 1350 0004 0410 3899

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

[Signature]

☒ Agent☐ Addressee

B. Received by (Printed Name)

David Felder

C. Date of Delivery

12/15/06

D. Is delivery address different from item 1? ☐ YesIf YES, enter delivery address below: ☐ No


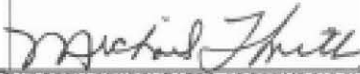
3. Service Type

☒ Certified Mail☐ Express Mail☐ Registered☐ Return Receipt for Merchandise☐ Insured Mail☐ C.O.D.

4. Restricted Delivery? (Extra Fee)

☐ Yes

Appendix D AIR FORCE FORM 813

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS		Report Control Symbol RCS: 06-17
INSTRUCTIONS: Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).		
SECTION I - PROPONENT INFORMATION		
1. TO (Environmental Planning Function) 14 CES/CEY	2. FROM (Proponent organization and functional address symbol) 14 MSG/SVRG	2a. TELEPHONE NO. x 7932
3. TITLE OF PROPOSED ACTION		
4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date) see page 2		
5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total action.) see page 2		
6. PROPONENT APPROVAL (Name and Grade) Ricky Magers	6a. SIGNATURE 	6b. DATE
SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)		+ 0 - U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.)	<input type="checkbox"/> + <input checked="" type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)	<input type="checkbox"/> + <input checked="" type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
9. WATER RESOURCES (Quality, quantity, source, etc.)	<input type="checkbox"/> + <input checked="" type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)	<input type="checkbox"/> + <input checked="" type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)	<input type="checkbox"/> + <input checked="" type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
12. BIOLOGICAL RESOURCES (Wetlands/floodplains, threatened or endangered species, etc.) Vegetation	<input checked="" type="checkbox"/> + <input type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)	<input type="checkbox"/> + <input checked="" type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)	<input type="checkbox"/> + <input checked="" type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)	<input type="checkbox"/> + <input checked="" type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
16. OTHER (Potential impacts not addressed above) Visual Quality of Grounds	<input checked="" type="checkbox"/> + <input type="checkbox"/> 0 <input type="checkbox"/> - <input type="checkbox"/> U	
SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION		
17. <input type="checkbox"/> PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____; OR <input checked="" type="checkbox"/> PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.		
18. REMARKS Columbus Air Force Base is located in an area that is in attainment; therefore, a conformity determination is not required.		
19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade) MICHAEL F. SMITH, REM Chief, Environmental Flight	19a. SIGNATURE 	19b. DATE 15 Oct 06

AF IMT 813, 19990801, V1

THIS FORM CONSOLIDATES AF FORMS 813 AND 814
PREVIOUS EDITIONS OF BOTH FORMS ARE OBSOLETE

PAGE 1 OF 15 PAGE(S)

4.0 PURPOSE AND NEED OF THE PROPOSED ACTION

4.1 The purpose of the action is to improve the grass on the golf course.

4.2 The system is needed because the grass needs to be watered more frequently than the rainfall allows. In addition, the maintenance report for the Whispering Pines Golf Course provided from the Staff Assistance Visit from 24 – 27 July 2006 recommended installation of an irrigation system.

5.0 DESCRIPTION OF PROPOSED ACTION

5.1 Proposal: 14 MSG/SVRG proposes to install an irrigation system to holes 1, 2, 3, 4, 5, 6, and 8. Holes 7 and 9 already have an irrigation system. Please see the attached map for the proposed location. See also the attached specifications for the sprinklers and piping.

5.2 Decision that Must Be Made: The decision that must be made by the Air Force is whether to install the irrigation system or not, and if so, where, how, and when to construct it.

5.3 Anticipated Environmental Issues

5.3.1 Hazardous Materials: Implementing the proposed action would increase the amount of fertilizer used on the golf course.

However, there would be no environmental impact because it would be done in accordance with local, state, and federal regulations, and in accordance with the recommendations of the manufacturer.

5.3.2 Hazardous Waste Disposal: No hazardous waste has historically been disposed on the golf course site, and none is anticipated in association with this project.

5.3.3 Noise: Noise associated with this project would be limited to construction, and would not change existing noisemaps for the installation.

5.3.4 Air Quality on and Off Base: There would be no gas/diesel fired equipment installed in association with this project, and no impacts to air quality are anticipated.

5.3.5 Visual Quality of the Building and Grounds: This project would positively impact the grounds for the installation by creating a greener space along C street, Independence Ave, Harpe Blvd, and F Street. The project will also improve views all around the golf course.

5.3.6 Traffic on the Flightline: This project would not impact traffic on the flightline.

5.3.7 Water supply and wastewater treatment: This project would consume an additional 1.5 million gallons per year of water from the existing supply system for the Base. This amount is negligible, as water supply for the base is measured in millions of gallons per day. There would be no increase in wastewater generation for the installation.

5.3.8 Surface Water and Stormwater: Surface water would not be impacted, because the only surface water on the installation is SAC lake, which is located in an area remote from the golf course. Stormwater is estimated to increase for the month of September by 1/2". This amount would not impact the environment because it would not impact drainage patterns for the installation.

5.4 Selection Criteria: Selection Criteria for the proposed action included location and operational requirements.

5.4.1 Operational requirements: The attached specifications were chosen due to water availability and existing water pressure.

5.4.2 Location Requirements: The proposed irrigation system should be located at holes 1, 2, 3, 4, 5, 6, and 8 because these are the unirrigated holes.

5.4.3 Interior requirements: n/a

5.4.4 Environmental Requirements: The director of golf would be required to submit a pollution prevention plan to the water quality manager prior to beginning work on the project.

5.5 DESCRIPTION OF THE ALTERNATIVES

5.5.1 No-action Alternative: The no action alternative is to not irrigate the golf course, and would involve no new construction. Grass on the golf course would continue to deteriorate in summer months due to lack of rainfall and rising temperatures during these months.

5.5.2 Proposed Action Alternative: No alternatives exist for this proposed action, as the golf course has already been sited

Impacts of Installing Irrigation System on the Golf Course

WITHOUT THE IRRIGATION SYSTEM

Estimated Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Amount?	0	0	0	0	0	0	0	0	0	0	0	0
Water Cost?	0	0	0	0	0	0	0	0	0	0	0	0
Estimated Average Stormwater Runoff	1/2"	1"	2"	2"	1"	1/4"	1/4"	1/4"	1/2"	1"	1"	1/2"
Hydrated Lime	0	0	0	0	0	0	0	0	0	0	0	0
Gypsum	0	0	0	0	0	0	0	0	0	0	0	0
Ammonium Nitrate	0	0	0	0	0	0	0	0	0	0	0	0
Roundup	0	0	0	0	0	0	0	0	0	0	0	0
Amdro	0	0	0	0	0	1 lb	1 lb	1 lb	0	0	0	0
Trimec Herbicide	0	16.5 lb AI	16.5 lb AI	0	0	0	0	0	0	0	0	0
62586 KERB 50-W Herbicide	0	0	0	0	0	0	0	0	0	0	0	0
Princep Caliber 90	0	0	0	0	0	0	0	0	0	20 lb AI	0	0
Fors Fungicide	0	0	0	0	0	0	0	0	0	0	0	0
Gordon's Herbicide	0	0	0	0	0	0	0	0	0	0	0	0
Proturf Fluid Fungicide III, & Scotts Lawn & Fungus Control	0	0	0	0	0	0	0	0	0	0	0	0
Illoxan 3EC	0	0	0	0	0	0	0	0	0	0	0	0
MSMA	0	0	0	0	30 lb AI	0	0	0	0	0	0	0
6-2-0 Milorganite	0	0	0	0	0	0	0	0	0	0	0	0
18-0-18 Country Club	0	0	0	0	0	0	0	0	0	0	0	0
13-13-13 International	0	0	0	0	2.5 T	0	0	0	0	0	0	0
K-Mag Potash	0	0	0	0	0	0	0	0	0	0	0	0

WITH THE IRRIGATION SYSTEM												
Estimated Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Amount?	0	0	0	0	150,000 gal	150,000 gal	300,000 gal	300,000 gal	150,000 gal	0	0	0
Water Cost?	0	0	0	0	\$300.00	\$300.00	\$600.00	\$600.00	\$300.00	0	0	0
Estimated Average Stormwater Runoff	1/2"	1"	2"	2"	1"	1/4"	1/4"	1/4"	1"	1"	1"	1/2"
Hydrated Lime	0	0	0	0	0	0	0	0	0	0	0	0
Gypsum	0	0	0	0	0	0	0	0	0	0	0	0
Ammonium Nitrate	0	0	0	0	0	0	0	0	0	0	0	0
Roundup	0	0	0	0	0	0	0	0	0	0	0	0
Amdro	0	0	0	0	0	1 lb	1 lb	1 lb	0	0	0	0
Trinec Herbicide	0	16.5 lb AI	16.5 lb AI	0	0	0	0	0	0	0	0	0
62586 KERB 50-W Herbicide	0	0	0	0	0	0	0	0	0	0	0	0
Princep Caliber 80	0	0	0	0	0	0	0	0	0	20 lb AI	0	0
Fore Fungicide	0	0	0	0	0	0	0	0	0	0	0	0
Gordon's Herbicide	0	0	0	0	0	0	0	0	0	0	0	0
Proturf Fluid Fungicide III, & Scotts Lawn & Fungus Control	0	0	0	0	0	0	0	0	0	0	0	0
Iloxan 3EC	0	0	0	0	0	0	0	0	0	0	0	0
MSMA	0	0	0	0	30 lb AI	30 lb AI	0	0	0	0	0	0
6-2-0 Milorganite	0	0	0	0	0	0	0	0	0	0	0	0
16-0-16 Country Club	0	0	0	0	0	0	0	0	0	0	0	0
13-13-13 International	0	0	0	0	2.5 T	0	0	0	0	0	0	0
K-Mag Potash	0	0	0	0	0	0	0	0	0	0	0	0

HARCO Class 200 PVC Fittings

SIZES

Harco Class 200 Pressure Pipe Fittings will fit all IPS Pipe (Iron Pipe Size). IPS Pipe is available in GDR 21, Class 200; GDR 20, Class 160; Schedule 40 and Schedule 80. Harco offers a wide selection of sizes 1½" thru 8", and a full compliment of reducers, reducing tees, and adapters. Harco's large inventory assures you of fast and complete orders.

QUALITY

Harco Pressure Pipe Fittings are manufactured from virgin PVC material approved by the National Sanitation Foundation (NSF) for use in potable water systems. High strength and long serviceability is assured by rigorous and continuing quality control testing.

SUPERIOR CONSTRUCTION

Harco's unique combination of one piece construction and heavy gasket design, assure the installer of a sure seal, backed by millions of installed, trouble free joints.



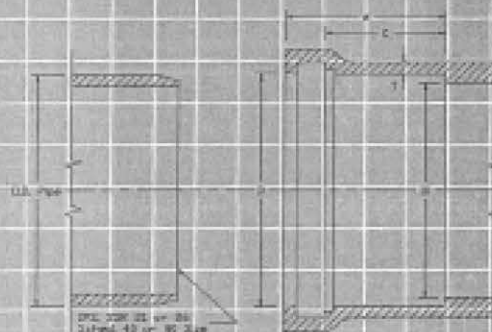
THE HARRINGTON CORPORATION
P.O. Box 10335
Lynchburg, Virginia 24506
(804) 845-7094

CLASS 200 PVC FITTINGS

ALL DIMENSIONS IN INCHES, WEIGHTS IN POUNDS

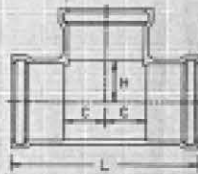
SUGGESTED SPECIFICATION

All fittings for Iron Pipe Size pipe shall be manufactured in one piece of injection molded PVC compound meeting ASTM D1784. Fittings shall be Class 200 and conform to requirements of DR 21. Fittings shall be designed to withstand a minimum of 630 psi quick burst pressure at 73 degrees F., tested in accordance with ASTM D1599. Bell shall be gasketed joint conforming to ASTM D3139 with gaskets conforming to ASTM F477. Push Joint or Mechanical Joint Ductile Iron fittings meeting AWWA C153 shall be allowed as alternative when PVC sizes are not available.



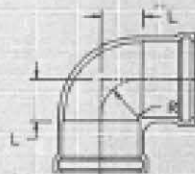
STANDARD JOINT DIMENSIONS IN INCHES

Nominal Diameter	O.D. Pipe	A	C	D	T	ID
1½	1.900	3.168	2.418	1.938	0.107	1.720
2	2.375	3.273	2.523	2.413	0.133	2.149
2½	2.875	3.383	2.633	2.913	0.158	2.601
3	3.500	3.520	2.770	3.538	0.191	3.166
4	4.500	4.103	2.990	4.558	0.246	4.072
6	6.625	4.571	3.458	6.693	0.358	5.993
8	8.625	5.161	3.896	8.708	0.463	7.805



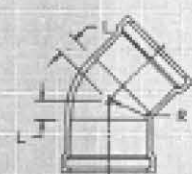
TEES

Cat. No.	Size	C	H	L	Wt
10330	8 x 8	4.5	4.5	19.3	21.3
10334	8 x 6	4.5	4.8	19.3	19.3
10335	8 x 4	4.5	4.5	19.3	16.7
10344	6 x 6	3.6	3.7	16.2	12.3
10345	6 x 4	3.6	3.7	16.2	11.0
10355	4 x 4	2.4	2.6	13.1	5.8
10356	4 x 3	2.4	2.6	13.1	4.9
10355	4 x 2	2.4	2.6	13.0	4.3
10365	3 x 3	2.0	2.2	10.9	2.8
10377	2.5 x 2.5	1.8	2.0	9.9	1.7
10385	2 x 2	1.4	1.5	9.2	1.4



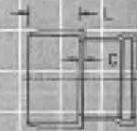
90 BEND

Cat. No.	Size	L	R	Wt
10530	8	4.5	4.2	16.3
10540	6	3.6	3.2	9.0
10550	4	2.5	2.2	3.8
10560	3	2.0	1.7	1.8
10570	2.5	1.6	1.4	1.3
10580	2	1.3	1.2	1.8



45 BEND

Cat. No.	Size	L	R	Wt
10630	8	2.0	4.2	13.3
10640	6	1.6	3.2	7.8
10650	4	1.1	2.2	3.4
10660	3	0.9	1.7	1.8
10670	2.5	0.7	1.4	1.1
10680	2	0.6	1.2	0.8



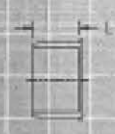
REDUCER

Cat. No.	Size	L	C	Wt
10434	8 x 6	4.4	0.4	5.4
10445	6 x 4	3.5	0.4	2.7



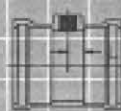
REDUCER
STYLE 2

Cat. No.	Size	L	R	Wt
10456	4 x 3	3.2	0.2	1.1
10457	4 x 2.5	3.2	0.2	1.2
10458	4 x 2	3.2	0.2	1.1
10467	3 x 2.5	3.8	0.2	0.6
10468	3 x 2	3.2	0.2	0.7
10478	2.5 x 2	3.5	0.1	0.5
10489	2 x 1.5	3.8	0.1	0.5



PLUG

Cat. No.	Size	L	Wt
10300	8	4.4	3.8
10340	6	3.6	2.3
10350	4	3.2	0.4
10360	3	3.1	0.4
10370	2.5	2.4	0.8
10380	2	2.8	0.2
10390	1.5	2.2	0.3



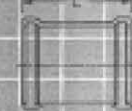
TAPPED TEE

Cat. No.	Size	L	Wt
1104x	6	1.3	3.8
1105x	4	1.3	3.1
1106x	3	3.0	2.5
1107x	2.5	1.9	1.5
1108x	2	2.7	1.2



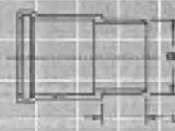
COUPLING

Cat. No.	Size	L	G	Wt
10130	8	11.1	25	10.0
10140	6	8.4	25	5.6
10150	4	8.4	19	2.7
10160	3	7.2	19	1.3
10170	2.5	7.0	19	0.9
10180	2	6.5	09	0.7
10190	1.5	6.4	09	0.5



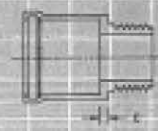
REPAIR COUPLING

Cat. No.	Size	L	Wt
10230	8	11.1	10.2
10240	6	9.4	5.5
10250	4	8.4	2.7
10260	3	7.2	1.3
10270	2.5	7.0	1.0
10280	2	6.6	0.7
10290	1.5	6.4	0.5



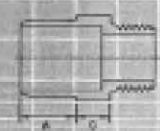
SPIGOT ADAPTOR

Cat. No.	Size	L	OD	Wt
11260	8	2.0	3.500	0.9
11270	2.5	2.0	2.875	0.7
11280	2	1.3	2.375	0.5
11290	1.5	1.1	1.900	0.3



BELL x MPT ADAPTER

Cat. No.	Size	C	Wt
10740	8	7.9	10.3
10750	4	6.6	4.5
10760	3	2.3	1.5
10770	2.5	0.3	1.2
10780	2	0.4	0.6
10790	1.5	1.5	0.5



PE x MPT ADAPTER

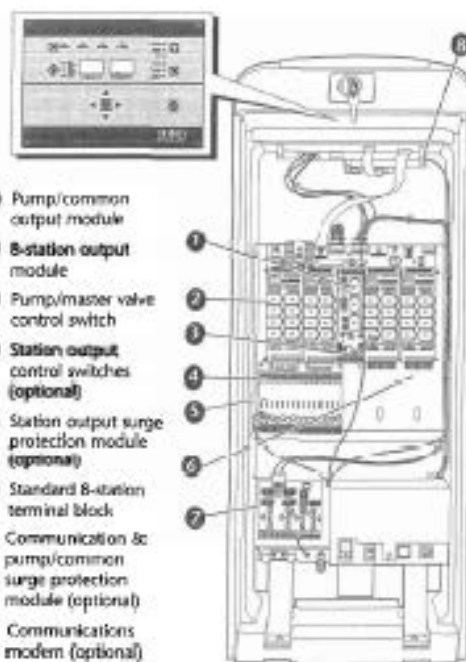
Cat. No.	Size	A	C	Wt
10840	6	4.3	0.4	5.3
10850	4	3.4	0.4	2.0
10860	3	3.0	0.3	1.3
10870	2.5	2.5	0.3	0.8
10880	2	2.7	0.3	0.3
10890	1.5	2.7	0.2	0.3

Toro Network LTC Plus Field Satellite



Features

- **Exceptional value with your choice of modules:**
 - 16 to 64 stations in eight-station increments
 - Standard or large-capacity terminal block (accepts two 14-gauge wires)
 - Standard or additional surge protection
 - Stations
 - Signal, pump and common
 - Input power
 - Manual On/Off station switches (optional)
 - Sturdy plastic or painted stainless steel cabinetry
- **Easy field installation and service:**
 - All components easily accessible and in full view for fast troubleshooting
 - Straightforward terminal block connections
 - Snap-in output modules
 - Guidepost aligns output module for easy installation
 - Junction box eliminates need to bend high-gauge power wire
- Operates as a stand-alone controller (great for new construction) or under the management of a central controller
- Dual-voltage power supply, 115 and 230 Vac
- 24 V ac actuation
- Primary power isolation switch
- 16 independent programs, with up to eight running simultaneously
- 14-day CALENDAR or 1- to 29-day INTERVAL scheduling by program
- 0 to 3 repeats per program
- 0- to 59-minute soak time between repeats
- Up to 12 starts per program, per day
- Exclusive Toro FlowSafe™ protects flow-managed programs in the event of a central or wireline interruption
- Station run times from 1 minute to 8 hours and 59 minutes
- Global or independent program adjust at the satellite
- Percent adjust by program (10 to 250%)
- Syringe 9%, allows 10 to 99% operating adjustment
- Up to 2 non-irrigation (switch) programs available with central software
- Non-volatile memory saves program data for up to 10 years without power
- Pump & Common control module with standard surge protection
- Manual operation by program (normal or syringe), independent station or multiple stations (up to 6)
- Patented Toro Hot Post for easy valve activation and identification



Electrical Specifications

- Input power:
 - 115/230 V ac, 50/60 Hz
 - 0.183 amps @ 115 V ac, 60 Hz (no load)
 - .872 amps @ 115 V ac, 60 Hz (maximum load)
 - 0.181 amps @ 230 V ac, 50 Hz (no load)
 - 0.50 amps @ 230 V ac, 50 Hz (maximum load)
- Station output power:
 - 24 V ac
 - 0.75 amps (18 VA) per station
 - 3.15 amps (76 VA) total
- Station draw:
 - up to 3 solenoids per station
 - 12 solenoids may operate simultaneously

Mechanical Specifications

- Dimensions:
 - Stainless steel Pedestal
13" W x 35 3/4" H x 13" D
(330mm W x 908mm H x 330mm D)
 - Plastic Pedestal
16" W x 39" H x 15" D
(405mm W x 990mm H x 381mm D)

Toro Dome Antenna

Features

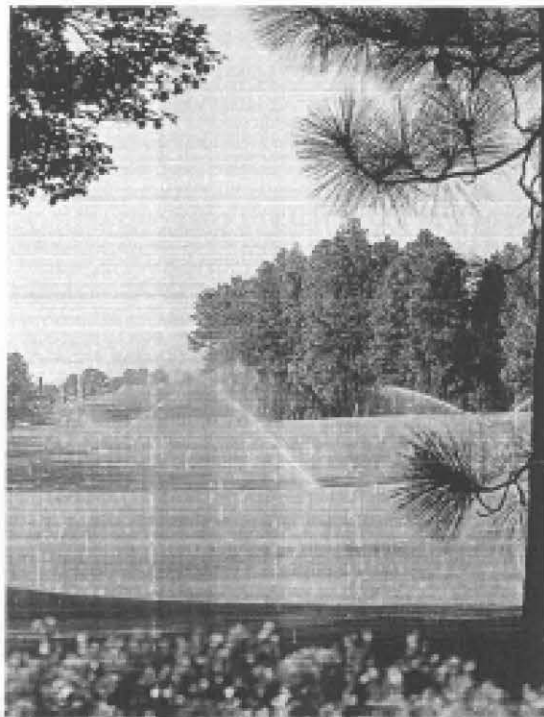
- New lower cost way to go with wireless Network LTC Plus!
- Offers reliable two-way wireless with a faceplate
- Eliminates pole-mounted antenna when used with plastic cabinets
- Service kit replaces current vent cover on plastic cabinet with new dome antenna cover, metal ground plane and 3 dB gain antenna
- Saves money and installation time
- Same color and texture as current plastic cabinet—*aesthetically pleasing*
- Retrofits to all plastic cabinets for E-Series™ OSMAC®, OSMAC RDR, DR2, Network® 8000 and Network LTC® Plus field satellites

NEW

Toro Network LTC Plus Plastic Field Satellite Radio Kit

Features

- Simple to install and offers better performance than other radio configurations
- Kit is compatible with current radio-equipped FIU models (FIU-2011 and FIU-2021)
- Supports hybrid radio/wireline configurations
- Kit includes:
 - Radio transceiver (supports 16 channels with preprogrammed frequencies; programmable to satisfy unique customer requirements)
 - Antenna
 - Interface cables
 - All hardware required to complete installation



Ordering Information—Dome Antenna

Model Number	Description
102-2419	Dome Antenna Kit for LTC Plus, Network 8000 and Network DR2 Series Plastic Cabinet

Ordering Information—Network LTC Plus Radio Kit

Model Number	Description
102-5025	Radio Kit Kit for Network Plastic Pedestal

Ordering Information—Network LTC Plus Satellite

<div style="text-align: center;"> <div style="display: inline-block; border: 1px solid black; padding: 2px;">LTCP</div> <div style="display: inline-block; border: 1px solid black; padding: 2px;">XX</div> <div style="display: inline-block; border: 1px solid black; padding: 2px;">X</div> <div style="display: inline-block; border: 1px solid black; padding: 2px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px;">X</div> <div style="display: inline-block; border: 1px solid black; padding: 2px;">X</div> </div>					
Configuration	Station Count	Cabinet	Output	Communication	Optional
LTCP—16-station Base Satellite	16—16 Stations 24—24 Stations 32—32 Stations 40—40 Stations 48—48 Stations 56—56 Stations 64—64 Stations	P—Plastic S—Stainless Steel (Painted)	6—24 V ac Electric	A—Stand-alone M—2-way Wire Modem	0—No Options 1—Large Capacity Terminal Block 2—Terminal Block and Additional Surge 3—Terminal Block and Switches 4—Terminal Block, Switches and Additional Surge
For Example: When ordering a 64-station Network LTC Plus Satellite with a plastic cabinet, electric output with a 2-way wire modem and optional large-capacity terminal block, you would order <div style="border: 1px solid black; padding: 2px; text-align: center;"> LTCP64P6M1 </div>					

Note: PDS must be ordered separately.
Network LTC is a registered trademark of The Toro Company.

700 Series Sprinklers

Dependability. Durability. Lower operation cost.

Dependability.

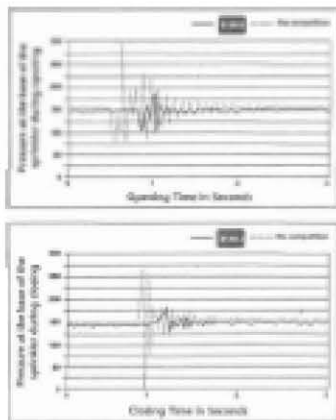
Simply, these gear drives keep going. With 35 years of experience, 700 Series sprinklers are built with proven toughness and durability. Their longevity proves their dependability, time and time again.

More reliability can be found within the long-standing 700 Series pilot valves. Pilot valves regulate pressure for accurate and continued performance. And, the pressure regulation is fixed — the pressure you want at purchase, is the pressure you can expect for the life of the sprinkler.

Durability.

With 700 Series sprinklers, there's no need to worry about the damage that heavy maintenance equipment can cause. These tough sprinkler bodies protect their important internal assemblies.

The construction of the internal components prolongs sprinkler life too. They operate such that the valve opening and closing is gradual, thus reducing stress and surges on the system. This not only protects the sprinkler, but the piping as well.



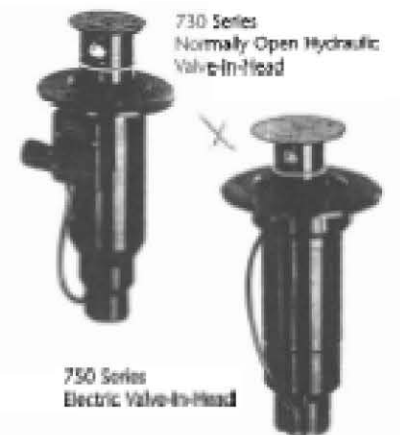
Lower Operation Cost.

Lower operation cost is an added bonus. The simplicity of design, shared components and lower maintenance requirements result in sprinklers that are not only economical to purchase, but also cost-efficient throughout the life cycle.

With Toro's sprinkler conversion assemblies, upgrading to the latest technology is a snap — you get all the features of our newest sprinklers with an easy retrofit.

Features

- Arc pattern
 - 730/750 models: Full-circle arc for total coverage
 - 760/780 models: Adjustable part-circle: 30°-330° for more efficient coverage (full-circle models available)
- Vented for precise regulation over a wide range of pressures
- Low flush at activation for efficient operation at low pressures
- Time-proven planetary gear-drive design for long life
- Four factory-set pressure settings prevent tampering: 50 PSI, 65 PSI, 80 PSI and 100 PSI (electric)
- Color-coded nozzles by radius and gallonage
- 3 styles/activation types to fit any application:
 - Electric Valve-In-Head
 - Normally Open Hydraulic
 - Check-O-Matic
- Check-O-Matic design prevents draining at elevation differentials of up to 15'
- Manual control at the sprinkler, On-Off-Auto (electric)
- Internal components are serviceable from the top of the sprinkler
- Pilot valve is protected by a rugged body
- Pops up to 3" to clear tall grasses
- The lowest valve-in-head friction loss in the industry
- 3 body threads available:
 - ACME
 - NPT
 - BSP
- Effluent indicators available:
 - Marker (Part No. 89-4719)
 - Yardage Marker (Part No. 89-4736)
 - 730 Cap (Part No. 89-8289)
 - 750 Cap (Part No. 89-8290)
 - 760 Cap (Part No. 89-8287)
 - 780 Cap (Part No. 89-8288)



Simple to use.

This valve removal tool, valve insertion tool and VIH snap ring pliers — available from Toro — are all you need for quick, easy installation and removal of drive and valve assemblies from body.




Nozzle Performance Data — 730/750 Series



	Nozzle Set 31		Nozzle Set 32		Nozzle Set 33		Nozzle Set 34		Nozzle Set 35		Nozzle Set 36		Nozzle Set 37	
PSI	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM
50	52	13.0	55	13.3	60	16.8	62	19.8	66	25.0	68	26.5	69	29.3
55	53	12.0	56	14.1	61	17.2	63	20.6	67	25.8	69	27.9	70	30.7
60	54	13.0	57	14.9	62	17.5	64	21.4	68	26.6	71	29.2	72	32.1
65	55	14.0	58	15.7	63	17.9	65	22.2	69	27.4	72	30.6	74	33.5
70	56	14.5	59	16.3	64	18.6	66	22.8	70	28.1	73	31.4	76	34.8
75	56	15.0	59	16.9	64	19.3	66	23.4	70	28.8	75	32.2	78	36.1
80	57	15.5	60	17.5	65	20.0	67	24.0	71	29.5	76	33.0	80	37.4
85	58	15.9	61	17.8	66	21.0	68	25.0	72	31.0	77	34.3	81	38.2
90	59	16.3	61	18.1	67	21.9	70	26.1	73	32.5	78	35.5	82	39.3
95	59	16.6	62	18.4	67	22.9	71	27.1	74	34.0	79	36.8	82	40.2
100	60	17.0	62	18.7	68	23.8	72	28.1	75	35.5	80	38.0	83	41.2

Radius* shown in feet

* Shaded areas represent nozzles not recommended at this pressure
 * Shaded areas represent standard pressure regulation at 50, 65, 80 & 100 PSI
 Toro recommends the use of a 1 1/4" (30mm) swing joint at flows over 25 GPM (95 LPM)

	Nozzle Set 31		Nozzle Set 32 		Nozzle Set 33 		Nozzle Set 34 		Nozzle Set 35 		Nozzle Set 36 		Nozzle Set 37 			
Bar	kPa	Kg/cm²	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM		
3.4	340	3.47	15.8	41.6	16.8	50.3	18.3	63.8	18.9	75.0	20.1	79	20.7	100	21.0	111
4.0	400	4.08	16.1	47.7	17.3	55.2	18.8	65.8	19.4	79.8	20.6	99	21.4	109	21.7	119
4.5	450	4.59	16.8	53.0	17.7	59.4	19.2	67.8	19.8	84.0	21.0	104	21.9	116	22.6	127
5.0	500	5.10	17.1	55.8	18.0	62.8	19.5	71.7	20.1	87.4	21.3	108	22.6	120	23.5	134
5.5	550	5.61	17.4	58.7	18.3	66.2	19.8	75.7	20.4	90.8	21.6	112	23.2	125	24.4	142
6.0	600	6.12	17.8	60.8	18.6	67.8	20.2	80.9	21.0	95.3	22.1	120	23.6	132	24.8	146
6.5	650	6.63	18.0	62.7	18.9	69.5	20.4	86.1	21.6	102	22.5	128	24.0	139	25.0	152
6.9	690	7.04	18.3	64.4	18.9	70.8	20.7	90.1	21.9	106	22.9	134	24.4	144	25.3	155

Radius* shown in meters









* Shaded areas represent nozzles not recommended at this pressure
 * Shaded areas represent standard pressure regulation at 3.4, 4.5, 5.5 and 6.9 Bar
 Toro recommends the use of a 30mm (1 1/4") swing joint at flows over 95 LPM (25 GPM)



	Nozzle Set 52		Nozzle Set 53		Nozzle Set 54		Nozzle Set 55		Nozzle Set 56		Nozzle Set 57		Nozzle Set 58		Nozzle Set 59	
PSI	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM	Radius	GPM
50	56	13.0	61	16.8	65	20.0	67	25.3	68	30.0	70	32.5	73	37.4	78	40.1
55	57	13.5	62	17.6	66	20.9	68	26.5	69	31.5	73	33.5	76	38.9	81	41.6
60	57	14.0	62	18.2	68	21.8	69	27.7	71	33.0	77	34.7	86	40.4	84	43.1
65	78	14.5	63	19.1	69	22.8	70	28.9	72	34.6	80	35.8	81	41.9	87	44.5
70	79	15.0	65	19.8	72	23.6	73	29.9	75	36.0	81	37.3	83	43.7	89	46.4
75	79	15.6	66	20.4	72	24.5	73	30.9	75	37.4	83	38.8	84	45.5	90	48.1
80	60	16.1	68	21.1	74	25.3	75	32.0	77	38.9	84	40.3	86	47.4	92	50.2
85	62	17.4	69	22.2	75	26.8	76	33.4	78	39.9	86	41.7	88	50.2	94	52.7
90	63	18.7	70	23.4	76	28.4	78	34.8	80	41.0	87	43.1	89	53.0	96	53.0
95	65	19.9	71	24.3	76	29.9	79	36.2	81	42.0	89	44.4	91	55.7	98	55.7
100	66	21.2	72	25.6	77	31.4	80	37.6	82	43.0	90	46.8	92	58.6	98	60.1

Radius* shown in feet

* Shaded areas represent nozzles not recommended at this pressure
 * Shaded areas represent standard pressure regulation at 50, 65, 80 & 100 PSI

750 Series Performance Chart — Metric																		
			Nozzle Set 52 		Nozzle Set 53 		Nozzle Set 54 		Nozzle Set 55 		Nozzle Set 56 		Nozzle Set 57 		Nozzle Set 58 		Nozzle Set 59 	
Bar	kPa	Kg/cm ²	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	Radius LPM	
3.4	340	3.47	17.1 49.2	18.6 63.6	19.8 75.7	20.4 95.8	20.7 114	21.3 123	22.5 142	23.8 152								
4.0	400	4.08	17.4 52.2	18.9 68.2	20.5 81.2	20.9 103	21.4 123	23.0 130	23.5 151	25.2 161								
4.5	450	4.59	17.7 54.9	19.2 72.3	21.0 86.3	21.3 109	21.9 131	24.4 136	24.7 159	26.5 168								
5.0	500	5.10	18.0 57.9	20.0 76.1	21.9 91.0	22.3 115	22.9 139	25.0 144	25.5 169	27.3 179								
5.5	550	5.61	18.3 60.9	20.7 79.9	22.6 95.8	22.9 121	23.5 147	25.6 153	26.2 179	28.0 190								
6.0	600	6.12	19.0 67.8	21.2 85.9	23.0 104	23.4 129	24.0 153	26.3 160	26.9 194	28.9 200								
6.5	650	6.63	19.7 74.8	21.8 92.1	23.2 112	24.0 136	24.6 158	27.0 167	27.6 209	29.8 209								
6.9	690	7.04	20.1 80.1	21.8 96.9	23.5 119	24.4 142	25.0 163	27.4 177	28.0 222	29.9 228								

Radius* shown in meters

* Shaded areas represent nozzles not recommended at this pressure
 * Shaded areas represent standard pressure regulation at 3.4, 4.5, 5.5 and 6.9 Bar
 * Sprinkler radius of throw per ASAE standard S388.1

Atte

600 Ser

Conversion Assembly

- Lower cost
- Higher pop-up
- Easier to adjust arc
- Easier to service

Quickly upgrades existing Toro technology to provide all the

730 Conversion Assembly



For upgrades to existing 630 and 660 Series sprinklers

750 Conversion Assembly



For upgrades to existing 650 and 680 Series sprinklers

730 Specifications

- Radius: 52'-83'
- Flow Rate: 11.0–41.2 GPM
- 1" NPT female-threaded inlet, BSP and ACME threads available
- Full-circle models
- Pop-up height: 3"

750 Specifications

- Radius: 56'-98'
- Flow Rate: 13.0–60.1 GPM
- 1½" NPT female-threaded inlet, BSP and ACME threads available
- Full-circle models
- Pop-up height: 3"

Electrical Specifications

- 24 V a.c., 50/60 Hz
- Inrush:
 - 50 Hz: 0.47 Amps (11.3 VA)
 - 60 Hz: 0.40 Amps (9.6 VA)
- Holding:
 - 50 Hz: 0.32 Amps (7.7 VA)
 - 60 Hz: 0.30 Amps (7.2 VA)



730 SERIES NOZZLE ORDERING MATRIX							
Nozzle Set							Press. Reg. Settings
31	32	33	34	35	36	37	
X	X	*	*	*	*	n/a	5—50 PSI
*	*	X	X	X	X	*	6—65 PSI
*	*	*	*	*	*	X	8—80 PSI
*	*	*	*	*	*	*	1—100 PSI

X—Optimum performance *—Available n/a—Not available



Model 734

750 SERIES NOZZLE ORDERING MATRIX								
Nozzle Set								Press. Reg. Settings
52	53	54	55	56	57	58	59	
X	*	*	*	*	*	*	*	5—50 PSI
*	X	X	X	X	*	*	*	6—65 PSI
*	*	*	*	*	X	X	X	8—80 PSI
*	*	*	*	*	*	*	*	1—100 PSI

X—Optimum performance *—Available



Model 754

Ordering Information — 730 & 750 Series Sprinklers

<div> <div>7X4</div> <div>X</div> <div>X</div> <div>XX</div> <div>X</div> </div>						
Body Inlet	Body Threads	Valve-In-Head Type	Nozzle		Pressure Regulation*	
730 3—1"	0—NPT 4—ACME 5—BSP	1—Normally Open Hydraulic 2—Check-O-Matic 6—Electric	730 31 32 33 34 35 36 37	750 52 53 54 55 56 57 58 59	5—50 PSI 6—65 PSI 8—80 PSI 1—100 PSI	
750 3—1½"						

For Example:

When ordering a 730 Series Sprinkler with a 360° arc, NPT threads, #32 nozzle, electric valve-in-head and pressure regulation at 50 PSI, you would order:

734-06-325

*Electric models only.

Appendix E SITE MAPS





Appendix F LIST OF REFERENCES

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